VOLUME 4, NUMBER 1 APRIL, MAY, JUNE 1979

PARKS

AN INTERNATIONAL JOURNAL FOR MANAGERS OF NATIONAL PARKS, HISTORIC SITES, AND OTHER PROTECTED AREAS

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Front cover: Many cities make room for parks. In Stuttgart they have made room for the city. Town forests, vineyards, meadows, fields and orchards take up more than half of the city's 20,174 ha (51,186 acres). This is the famous Weissenburg Park. Photo: Helmut Stiebling. Back cover: Clear warm waters with their colorful corals, brilliant fishes and other fascinating forms of marine life are a highly attractive combination for visitors almost anywhere in the world's tropical regions. Here visitors at Buck Island Reef in the U.S. Virgin Island practice using face masks before exploring an underwater trail. USNPS Photo: M. Woodbridge Williams.

PARKS Magazine is an international publication for the exchange of information on the planning, use and management of the world's national parks and other protected natural and cultural resources.

PARKS Magazine is published by the International Union for Conservation of Nature and Natural Resources (IUCN) for a consortium whose members are FAO, UNEP, UNESCO, OAS, Parks Canada, U.S. National Park Service, IUCN and the World Wildlife Fund. It is produced with the cooperation of the Eastern National Park and Monument Association.

PARKS (USPS 397-270) is issued quarterly in separate editions in English, in French under the title PARCS, and in Spanish under the title PARQUES. Published at Room 3121, 1100 L Street, N.W., Washington, D.C. 20005. Controlled circulation postage is paid at Washington, D.C. Distribution of all editions is by mail. For information please address:
The Editor
PARKS Magazine
c/o National Park Service
United States Department of the Interior
Washington, D.C. 20240/U.S.A.

PARKS printing costs are paid with donated funds. Ideas or viewpoints expressed do not necessarily reflect those of the sponsors, collaborators or advisors.

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The English and Spanish editions of PARKS Magazine are printed in the United States. The French edition is prepared and printed in Canada by Parks Canada.

The English edition of PARKS Magazine is available on microfilm from University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106/USA.

Bernard Salvat

Trouble in Paradise Part 2: Coral Reef Parks and Reserves

Degradation and pollution affecting coral reefs were reviewed in a first article in PARKS, Volume 3 (2), July-September 1978. Sites where these degradations occur are becoming more and more numerous and each of them spreads out dangerously. Countries with coastal reefs and lagoons in the intertropical zone are facing the effects of increasing development within a western-type economy. These may be direct, such as fishing, sand extraction, oil exploitation, development of urban infrastructures and housing. They may be indirect, such as oil pollution coming from the ocean or influences from the land such as the impact of extensive land-disturbing development projects, intensive agriculture, industrial complexes and the various kinds of pollution produced by urban areas.

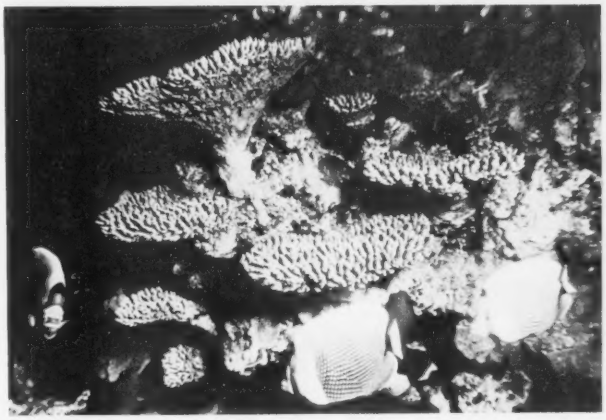
Importance of Coral Reefs

The living reef is one of the richest ecosystems of our planet, both in number of species and in biological production. Such an ecosystem is the result of a long evolution — over more than a hundred million years — within a relatively stable environment. Interdependence between reef organisms has multiplied more than in any other environment, building a complex community, the scientific investigation of which only started in a major way after World War II.

The importance of coral reefs has been shown in its many aspects: *esthetic, cultural, scientific* as well as *economic*. Some of these aspects are mentioned here. Along with associated mangrove areas, coral reef environments are characteristic of the entire intertropical zone. They protect the coasts and provide sheltered waters, especially around ocean islands which would be difficult to approach without these coral reef barriers. More than 400 islands exist solely as the result of the building activity of reef organisms (corals, calcareous algae). These islands would otherwise be totally submerged since the volcanic masses on which they are built now lie several hundred meters below the ocean surface as a consequence of subsidence; these low islands or atolls are made only of accumulated coral materials which grew in pace with the subsidence of volcanic cones.

The development of underwater recreational activities gives growing economic importance to coral reefs. In the Caribbean for instance, a quarter of a million divers spend some $125 million every year while enjoying the reefs.

As regards the exploitation of reef resources and their conservation, the following contrast should be stressed. In the past, coastal populations depended upon these marine environments and ensured their protection and renewal as they used these resources within a traditional subsistence economy. Nowadays the traditional social structures and restrictions, which maintained a favorable balance between the natural



Diversity of forms and functions: coral reef communities are among the world's most productive systems as well as the richest for plant and animal life, with highly complex interrelationships. The paradox of reefs and reef communities lies in their extraordinarily complex relationships linked with a high susceptibility to external disturbances.
Photos: C. Rives-Cedri

Coral reefs and their rich communities of life are found throughout the tropical region. Here a visitor to Honduras' beautiful offshore coral gardens focuses his camera on a passing grouper.
Photo: H. Logan Holtgrewe

environment and man, are disappearing. The newly-developing market economy brings with it the threat of overexploitation of the stocks of economically interesting species as well as a degradation of the environment.

Economic Interests of Coral Reef Parks and Reserves

Terrestrial ecosystems are far better understood and managed by man than are marine environments. This discrepancy shows strikingly in two scientific and technical fields which basically have the same objective: agriculture and aquaculture. The former is highly developed whereas the latter is in its very first stages of development. In the marine environment, harvesting — i.e., fishing — remains up to this very day the main form of exploitation, whereas aquaculture accounts for only 5 percent of the world marine fishery production. As such, collecting and fishing must be carried out on a rational basis in order to avoid overexploitation and the exhaustion of stocks. Unfortunately, this has already occurred for some coral reef resources, e.g., mother of pearl, trochus, turtles. Reef fish stocks are overexploited only locally, within range of urban centers or around islands with a high population density where traditional social structures have been disrupted. The technology for exploiting coral reef fishes, fortunately, is not well enough developed to allow commercial exploitation for the international market. Such technology may develop quickly, however, considering the growing demands of an ever-increasing population. As soon as this new resource is identified and the means for its large scale exploitation are developed, it is to be feared that this will almost certainly lead to plundering and overexploitation.

The marine environment possesses a number of unique characteristics. These should be recalled in the perspective of nature protection and conservation projects. First is the absence, or rather the scarcity, of any physical limits and barriers. The extent of the marine environment and the vastness of the oceans are matched by the dispersion power of eggs and larvae of marine animals which are endowed with a considerable reproductive potential. This accounts for the great extent of most marine and coastal biogeographic "provinces." The Indo-Pacific province, for example, stretches over two-thirds of the earth's circumference. Thousands of species are distributed from the African coasts of the Indian Ocean all the way to Polynesia (Hawaii, Tahiti) in the central Pacific. Under such conditions, the possible extinction of an endangered species cannot be considered in the same light as that of the more accessible land species with limited habitats. Larger marine species such as whales have become endangered, but in most cases one is faced with rarefaction of stocks rather than with total extinction or endangerment of a species. This decrease in stocks is well known for economically important species around densely populated islands. Here coral reefs also undergo a fast environmental degradation with considerable repercussions on the populations of the species involved.

In brief, it appears that: 1. the relationship between man and the sea is that of a collecting activity with a danger of resource overexploitation; 2. marine animals are, for the most part, characterized by very extensive distribution and a considerable reproductive and dispersion capacity; 3. the coral reef environments are mainly affected by degradation and pollution which have a repercussion on the stocks of exploited or exploitable species, whereas overexploitation of species is, so far, a rare and localized occurrence, and species whose worldwide survival is endangered are an exception.

The establishment of parks and reserves in the coral reef environment is abundantly justified on cultural, esthetic and scientific grounds, as well as for the benefits these parks and reserves may bring to the development of tourism, and especially of underwater recreational activities. There is, however, another major aspect. These parks and reserves are a source of recruitment for neighboring areas recovering from the effects of pollution or where species have been overexploited. This role of parks as a source of recruitment for naturally restocking exploited surroundings is of considerable interest and should be used as a strong argument in favor of the establishment of marine parks. In more temperate coastal areas, Japanese fishermen have long realized this and understood the value of marine parks and reserves to the fishing economy in adjacent areas.

Coral Reef Parks Today

One might be tempted to argue that marine conservation is a recent concern. In fact, it was only at the First World Conference on National Parks (Seattle, 1962) that a recommendation was passed on the matter. Later, in 1971, a conference (Noumea) was held on the protection of reefs and lagoons in the southern Pacific, and in 1975 the first World Conference on Marine Parks and Reserves was convened (Tokyo). However, this concern is not new. Conservation of the marine environment and especially of coral reefs was traditional among many populations, in particular island people in the intertropical zone. This was a vital matter to them, in order to ensure the renewal of resources without which these populations could not have existed.

The establishment of marine parks and reserves thus appears as a modern technique to control the degradation of ecosystems which results from over-development of coastal areas where, up to now, a balance between man, the environment and its natural resources has existed.

The first world list of marine parks and reserves was established in 1974 (Björklund, 1974, and Gare, 1976). Some 50 parks and reserves are listed which include coral reefs. These are marine parks or coastal parks with an adjacent marine area. Some 10 parks are located in the Caribbean (Florida, Bahamas, Virgin Islands, Tobago); more than 30 are in the Pacific (Philippines, Japan, Hawaii, Australia — The Great Barrier Reef in particular). The rest are to be found in Indonesia, the Indian Ocean and the Red Sea. This list may have increased by this date, and a Working Group on Coral Reefs, under the sponsorship of IUCN's Survival Service Commission, has started a survey of reef parks and reserves in order to define, in particular, geographic conservation priorities. The first marine park, Hundred Islands in the Philippines, was established in 1941. Hundreds of similar parks and reserves now are being planned throughout the intertropical zone, but their efficient protection and management is quite another matter, apart from legal and regulatory problems. Recommendations for the establishment of coral reef parks are no different, or at least are not treated separately, from those for other marine parks (see Salvat, 1976).

Criteria

Criteria for defining the limits of coral reef parks do not seem to us to differ basically from those that have been recommended for the establishment of marine parks in general. This was discussed in detail in a paper by Carleton Ray (1976) who defines ecological criteria (threats to the environment, representativeness, uniqueness, diversity of habitats and species, absence of degradation), and scientific and cultural criteria as well as practical criteria which may facilitate the establishment of a park (fragility, feasibility, national and international scientific values, economic values).

However, some selection criteria are particularly important in the case of reef and lagoon parks and should be stressed. These concern the functioning of the coral reef ecosystem as well as control of the pollution and degradation which may affect it. As regards the functioning of the ecosystem, it would be useless to protect a fringing reef without its barrier reef, and vice versa. Interrelationships between both systems are easily shown for species whose juvenile and adult stages interchange between these systems. The fringing area is a nursery for many fishes, some of which are economically important. Furthermore, the limits should include part of the oceanic coastline, off the barrier reef, and part of the land ecosystem (possibly with its mangrove border). A park thus outlined and centered around the reef-lagoon-coastal ecosystem will also be better protected against terrestrial as well as pelagic pollution. Knowledge of pollution which may disturb a particular reef or lagoon allows us to better define the park boundaries in relation to the sources of damaging influences. Pollution coming from the open sea, usually oil, is relatively infrequent, but there is practically no way of shielding a reef from it. On the other hand, types of pollution originating on land are numerous, varied and abundant (silt laden rivers, pesticides, sewage, industrial wastes . . .) The establishment of coral reef parks should be recommended in areas with no polluted rivers flowing into them, and preferably around islands and islets which are in themselves protected. This would limit the possible occurence of pollution from terrestrial sources.

Objectives and Planning of Coral Parks

Man is a terrestrial animal. When faced for the first time with the underwater world his reaction is usually one of uneasiness or fear. A visit to a marine or submarine park should, in our opinion, give the visitor both a lesson and a feeling: A lesson about this strange environment, its diversity, its richness in form, life and color, and its importance and complexity; it should impart a feeling of respect towards this habitat and its inhabitants. A better knowledge of and respect for a world so different from his own and in which he can exist only by artificial means will provide a basis for an understanding of conservation principles needed to protect these areas.

The problem of conflicting activities within a park is difficult to resolve. A distinction should be made between activities which bring visitors into intimate contact with the sea (swimming, skin diving, scuba diving, photography, waterskiing) and those that bring him underwater without, however, taking him out of his normal environment (underwater observation towers, underwater television, mini-submarines). Generally speaking, a marine or reef park information center should be provided for visitors at the park entrance. Education of visitors should begin at the earliest stage, on their entry into the park, and preferably with the help of audio-visual equipment. The various aquatic and underwater activities may be suggested to complement this introduction, to further identify the esthetic, recreational or educational values. Shell and coral collecting and fishing activities normally should be prohibited.

The impact of aquatic and underwater activities on a coral reef park has been described by Alan H. Robinson (1976). Most damaging are the careless discarding of wastes from boats and the direct contact of visitors with the substratum. The anchoring of boats in fragile areas and allowing uncontrolled diving over such sites should be prohibited or carefully controlled. It might be appropriate to develop underwater trails with submerged information signs placed well above the sea bottom, and with mooring buoys available in order to reduce damage from anchors.

It should not be necessary to stress the need for a core area within the park, if possible closed to the public, and for a buffer zone around it with well defined areas for each type of permissable recreational activity. These should be planned for use on a rotation basis. Zoning and rotation of activities in a marine and submarine park are relatively easier to plan and carry out than on land, as the sea surface and the water itself are the equivalent of a transportation network in a land park, with the great advantage that in marine parks there is no need to build roads.

The self-guided underwater trail is one of the techniques used to interpret marine park values to active visitors. This group, and two examples of simple underwater signs, are at Buck Island Reef in the U.S. Virgin Islands. Photo: USNPS – M. Woodbridge Williams

This block of dead coral has been overturned. It reveals the numerous small animals living on its lower face. These die within a few hours if the shell collector or the tourist who turned up the block does not put it back into its original position. Photo: B. Salvat

Conclusion

Coral reefs are among the most productive ecosystems of our planet. They "fringe" more than half the coastlines in the intertropical zone where they generally play an important role in the subsistence economy of coastal nations, many of which are classified as "developing." Coral reefs are especially important in island ecosystems where resources are limited and are influenced by the economic fluctuations of world trade. It is an unfortunate fact that, in many of these areas, there has been a general weakening of traditional cultural and socio-economic practices which had evolved over the centuries to ensure lasting productivity of coral reef ecosystems by striking a balance between man and his environment. Increasingly, the balance has shifted toward degradation, pollution and overexploitation.

Research on the tropical coastal environment has only recently started and knowledge of the structure and functioning of coral reef and mangrove ecosystems lags far behind research on environments in temperate zones. A considerable effort to catch up must be made, to a degree and urgency equal to the importance of the reef ecosystems in developing tropical countries.

Conservation and protection of coral reefs also are in their early stages, compared with advances made in terrestrial environments. The small number of existing parks, less than 50, stresses this difference. However, marine parks and reserves offer a considerable economic advantage: they are important sources of recruitment for neighbouring exploited areas. If man is to partly solve the problems posed by a racing population through a rational management of the natural environment, it is high time to start conserving coral reefs before it's too late, to control or limit degradation and pollution endangering this environment, to increase the number of parks and reserves for economic and educational reasons and to introduce regulations to control access, activities and exploitation. In many instances, such regulations may be patterned after traditional customs of coastal people which effectively ensured the conservation of the environment before these countries became "westernized," if they are not retaining an aboriginal life style.

If our scientific knowledge of coral reef environments does not increase, and if regulations for their conservation and rational management do not emerge in time, I fear we shall witness the total destruction of these environments once the techniques of exploitation for the world markets are learned. The human urge to exploit has become a monster. Such behavior can be changed, however, and we must work toward that goal.

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Dr. Salvat's paper was translated to English from the original French by Miss Laurence de Bonneval, Scientific Secretary of the French Committee of UNESCO's Man and the Biosphere Programme.

SSC/IUCN Coral Reef Group Formed

A Survival Service Commission nine-man working group on coral reefs has been formed. Its aims are:

1) to evaluate the efficiency of present coral-reef reserves and, in conjunction with the Commission on National Parks and Protected Areas, to promote the establishment of other reserves;

2) to list for each main coral reef any destructive activities — to describe the main types of harmful impact in non-specialist language so as to influence decision-makers and the public — to define projects that merit inclusion in the IUCN/WWF Marine Programme.

3) to map the major areas of degradation. Under the chairmanship of Bernard Salvat the group is so constituted as to cover (finally) all the main coral-reef areas. The nine consultants are from: Jamaica, Mexico, Hawaii, French Polynesia, Guam, Philippines, Australia, India, Israel. Three more consultants — from Brazil, Indonesia and Kenya — are to be appointed.

It is emphasized that because most coral reefs are in developing countries and because knowledge of this biotope and associated tropical species is scanty, very precise recommendations are needed with regard to coral-reef management.

The group expects to achieve its objectives within three years — that is to say before the next IUCN General Assembly. Information and results as they come to hand will be given in a 3-times yearly newsletter. The first issue was published in December 1978. It is available from: *Dr. Bernard Salvat, Laboratoire de Biologie marin et malacologie, Ecole Pratique des Hautes Etudes, 55, rue de Buffon, 75007 Paris, France.*

(Reprinted from the IUCN Bulletin of January 1979)

Dame Sylvia Crowe

The Value of Small Woodlands to Landscape and Society

Forests, the habitat of man's ancestors, have dwindled through men's action; what remains are less kindly environments for human life.

The need to reverse the process of deforestation is now evident, but too little is being done about it.

The need is world-wide, not least in heavily populated countries.

While the technique and value of establishing and conserving forests for timber production are well known (though insufficiently practised), less is understood about the value of smaller woodlands and their contribution to the richness of life, human and otherwise.

The more densely populated a country may be, the greater its need for trees. The reasons are manifold, and include: 1. The amelioration of climate, 2. The conservation of dwindling stocks of wildlife, both plant and animal. 3. Opportunities for recreation. 4. The visual quality of the landscape.

The situation in Europe

No country has appreciated this more than the heavily populated Netherlands, where a significant proportion of the hard-won reclaimed land has been assigned to the establishment of woodlands devoted primarily to these social and conservation ends, rather than to timber production.

West Germany, despite the fact that it is already rich in forests, has undertaken extensive planting on industrial wastelands, thus providing future forests for the enjoyment of the industrial population.

In France, communally owned town woodlands are traditional and provide both amenity and timber, while in Switzerland the communes' forests on the lower mountain slopes, serve also as protection from avalanches.

Britain, one of the most sparsely afforested countries in Europe, has been slow to encourage the establishment of small woodlands (as opposed to forests for timber production where the record of new planting is exceptionally high). This is regrettable, since the surprisingly well-wooded appearance of the landscape, despite the low acreage, results from the lavish scattering of copses and hedgerow trees. Historically these were planted and conserved on large estates whose owners cared for both the appearance of the landscape and the provision of coverts for game. With the break-up of large estates, more intensive farming and, recently, the ravages of elm disease, this generally well-timbered effect has suffered severely and it is now realized that urgent action is required.

The visual value of trees and woodlands

This is exemplified in two contrasting patterns; in the Netherlands the recurring small farmsteads on the polders would appear very bleak and isolated without their sheltering blocks of woodland. The same pattern appears in many exposed upland regions where the shelter belts combine function with beauty, humanizing and holding the dwellings within the harshness of the surrounding landscape.

A quite different pattern is seen in southern Britain where the matrix of small woodland and scattered trees gives the appearance of unbroken, light woodland, a unified landscape, while in fact the land is scattered with buildings and traversed by roads. Without the trees the appearance would be restless and urbanized.

Right: Small woodlands and shelterbelts of trees add strong visual qualities as well as practical values to this upland landscape in the Tweed river valley. Photo: © The Forestry Commission. Commune-owned forests in Switzerland supply much of the needed timber and fuel as well as areas for recreation, habitat for wildlife, and shelter to moderate wind and weather. Photo: Mrs. Susan Vetter

Small woodlands in densely populated areas require careful maintenance to withstand the heavy use they receive. This remnant of a medieval hunting forest in central London, Holland Park, survives because of its system of paths and carefully sited low fencing. Photo: Stephen Rettig

The recreational value of woodland

This has always been recognized, but it gains in importance with pressure of population and increase of leisure.

Many great cities have their recreational forests, often descended from royal hunting forests. The Bois de Boulogne of Paris, Brussels' Forêt de Soignes and London's Epping Forest have long served their citizens as places of quiet refreshment (as well as for boisterous picnics). In the Amsterdam Bos a forest has been created especially to provide for all types of open-air recreation.

The advantages of woodland for recreation compared to open spaces are many. Woodland can absorb crowds and give an illusion of solitude, there are more varied walks and changes of scene, more vivid seasonal changes and richness of wildlife, while extremes of heat and cold are modified.

The maintenance cost of woodlands is low compared with most types of open space. This is particularly so where the woodlands are large, and the visitor density not too high. The costs may be wholly or largely recouped by timber value, trees being one of the few crops which can accept public access — at least by path — usually without significant damage.

Whatever the size of the woodland, a plan is required to reconcile recreation with conservation and forest operations. By the careful siting of paths, visitors can be guided away from areas vulnerable to disturbance, either by reason of their wildlife, plant communities or soil conditions.

Small woodlands even in densely populated areas, are still of value, but their maintenance requires great care. For instance, with heavy usage, particularly on wet and heavy soils, separate tracks are needed for horse riding and walkers. There may need to be rotation of areas for access, to allow regeneration of overworn forest floor.

An example of intensive but sensitive conservation can be seen at Holland Park in London. Here a remnant of medieval hunting forest, now only some 15 acres (6 ha) in extent, has survived within the surrounding development. The public use is heavy, yet in addition to an extremely varied bird population, areas of natural forest flora survive. This is made possible by an intelligent system of paths and the use of skillfully designed and sited low fencing, winding among the tree trunks and broken by groups of the native *Ilex aquifolium,* thus avoiding any sense of constraint and allowing the wildlife to be enjoyed in a sylvan setting.

This is an extreme case, but it illustrates how small woodlands can serve a purpose within the confines of a great city.

Trees in hot climates

Important as trees may be as an adjunct of social life in temperate countries, the need is even greater in hot climates. Here the form of planting is likely to be in shady groves rather than true woodlands. The prototype is the shaded market and meeting place in an African village, where all social contact takes place under the shade of trees. It is vital that this provision should be incorporated in all plans for development in hot climates.

Important as trees and woodlands may be as an adjunct of social life in temperate countries, the need is far greater in hot climates. In shady groves or under a few large trees, countless village markets provide local societies with their major point of social contact. This marketplace is in Bondoukou, Ivory Coast. Photo: David Reynolds

Trees and woodlands in the agricultural countryside

The attitudes of farmers to trees differs widely from one country to another. This is due partly to climate, soil conditions and farming methods, but also to tradition.

The inclusion of shelter belts in plans for recasting small holdings in Germany probably owes something to that country's forest tradition.

In bleak, exposed areas the need for shelter belts is obvious, and they are particularly valuable in stock rearing areas. Wherever they occur, they are of inestimable value to the appearance of the landscape, as well as to its climate and wildlife content.

Shelter from sun can be just as important as shelter from wind. In the

Although already rich in forests, West Germany makes a systematic and highly successful effort to convert industrial wastelands into forests, farms and lakes. This attractive woodland near Cologne (right) was planted some 20 years ago on land reclaimed after opencast mining. Photos: Rheinbraun/Kramp

stock rearing regions of Australia, destruction of the eucalypts has been drastic, but recently a growing realization of the value of their shade to stock has given rise to some replanting.

In fertile, lowland, areas devoted to cereal crops and worked by heavy machinery, there is often strong resistance to giving up space to trees. This objection is particularly marked where the fields are large and give the possibility of long, unbroken tractor runs. This tendency is very marked in arable farming areas of England and efforts are now being made to find acceptable ways to introduce trees into the agricultural landscape. Shelter for buildings, planting copses on small areas of less fertile ground and planting along boundaries and roadsides are all advocated. On soils where there is danger of wind erosion there is of course an overwhelming reason for planting breaks.

Of the two financial inducements available, timber value and government grants, the latter is usually the greater incentive, and considering the benefit of trees and woodlands to the country at large, it would seem a worthwhile expenditure of public money. Nevertheless, timber value should not be neglected and more information should be made available on species combining financial, conservation and visual value. Nor is timber the only value which may accrue. In Kashmir, for instance, the branches of the roadside salix are gathered for fodder.

Trees and woodlands in relation to urban development

There are often more opportunities for establishing woodlands as a part of urban development than in the agricultural countryside. We have seen the immense value of woodlands for recreation in and adjacent to cities. In some well-forested countries, cities already have access to forest at their very doors. At Tapiola, in Finland, the town lies in a clearing within a vast forest, giving a remarkable visual sense of containment, as well as welcome shelter and a roaming ground for the citizens. Stuttgart is an older example, where extensive woodlands lap up to the outskirts of the city and merge with its magnificent parks system.

In both Britain and Germany the old slag heaps are being converted into woodlands. In the derelict mining valley of the Rhondda, in Wales, forests are now growing up around the old villages and giving them a new sense of well-being. At Stoke-on-Trent, a great forest park is being created on the old waste tips which once disrupted the urban fabric. These are efforts to heal old scars with new woodlands, but opportunities also exist to incorporate woodlands into plans for new development. There tends to be a belt of run-down land on the outskirts of cities. Agriculture is impeded by pressure of population and the landscape is fragmented by isolated buildings, sewage farms and other urban utilities. The advantages of enveloping these in a forest matrix would be immense, giving, on the city side, a pleasant environment for the townspeople and, on the outer perimeter, a buffer zone to protect agriculture. Visually, all the disruptive elements of roads and structures would be absorbed within the background of trees.

Mineral workings give another opportunity for the establishment of woodlands. It is often easier to reclaim the land with trees than to return it to agriculture. The result can be areas of exceptional value both for wildlife and for recreation.

Reservoirs are natural opportunities for planting, to both the functional advantage of the reservoir and to the environment.

Roads not only give opportunities for planting on verges, embankments and cuttings but, in the case of new highways, they may bisect portions of land which are better planted as woodland than left in agriculture.

Other industrial developments give opportunities for planting, even if only on a small scale.

Power stations, sewage farms and industry nearly always provide some area of otherwise waste space, where at least a small copse can be planted.

One of the advantages of combining tree planting with industrial development is the negligible cost in relation to that of the main structure.

While it may well be necessary to persuade farmers and landowners to plant by providing grants and tax concessions, tree planting related to industry may be required as a planning condition.

Conclusion

Whatever the visual and social benefits of woodlands, perhaps their greatest contribution is the conservation of wildlife and their beneficial effect on the health and fertility of the land as a whole.

For this reason, the choice of species is all important. While timber value largely governs the species in large timber-producing forests, there is a far wider choice for these smaller and often non-commercial woodlands. Indigenous species and those most conducive to wildlife can be given preference, for above all, the small woodlands are multi-purpose and their function is far wider than that of pure timber production.

Dame Sylvia Crowe, DBE, PPILA, is one of Great Britain's most respected Landscape Architects. She is widely known for her work on projects concerned with large areas of countryside. After long service on IUCN's Commission on Environmental Planning, she was made an Honorary Life Member of the Commission.

Hans-Dietmar Koeppel

The Aletschwald Nature Conservation and Study Center

The Swiss Association for Nature Conservation (SBN) is the oldest and largest private nature conservation organization in Switzerland. It owns and administers a good number of nature reserves, publishes a magazine for its 93,000 members and works to enlighten the public on conservation matters. The SBN exerts a strong influence on legislation and land alteration projects in Switzerland, and cooperates closely with national and international organizations having mutual aims.

In 1976 SBN opened the Aletschwald Nature Conservation and Study Center, its first. The Center is located at the edge of the 640-acre Aletschwald Nature Reserve, an area protected since 1933 because it contains one of the last well-preserved larch-pine woodlands. The Aletschwald is of special scientific importance because the woodlands lie between two natural distribution limits: The edge of the great Aletsch glacier forms the lower, while the timber line forms the upper. The Reserve is exposed to the northwest and its elevation is between 1600 and 2300 meters above sea level.

The area of the Aletschwald is totally protected and can only be entered on a few paths which are minimally constructed. Despite this many visitors come to the Reserve in the summer. The opportunity to educate the visitors and win supporters for nature conservation, using the example of the Aletschwald, has been realized by SBN through its center.

In 1973 the Association purchased the Villa Cassel and the Chalet Cassel, including their large properties at the Aletschwald's fringes. The buildings were constructed after the turn of the century by the London banker, Sir Ernest Cassel and later used as a hotel. Both roomy buildings were the basis of a plan for the Center which was developed by the author for SBN. Villa and Chalet Cassel are situated 20 minutes from the nearest cable car and can only be reached on foot.

Below: The location of the Aletschwald Study Center in Switzerland. Right: The Aletschwald with climax of the larch-pine woodlands (middle) and the young moraine area.

Tasks and Conception

For the Nature Conservation and Study Center the following goals have been laid down:

- attract and inform day visitors and promote membership in SBN;
- training or advanced training through visitor courses;
- stimulate interest in natural science research in the Aletschwald;
- provide, coordinate and assess research projects on the Aletschwald;
- have a voice in the development of tourism in the Aletsch region.

These tasks were derived from the objectives that were established by SBN for the Center in the beginning. Visitors to the Center should:

- develop an understanding of nature's processes;
- feel responsible for maintainance of the undisturbed processes in nature;
- prevent activities that are detrimental to the processes;
- gain the ability to recognize such processes and experience and enjoy nature as a whole;
- understand and respect protection measures;
- through better understanding, make protection measures unnecessary in certain instances;
- stimulate and promote nature conservation.

In Villa Cassel an extensive exhibit informs the day visitors about the geological evolution of the Aletsch area, the relationships of its communities of flora and fauna and its cultural history. Exhibits also are devoted to research projects and their purposes and results, and to the work of SBN in the protected Aletschwald area. The exhibit subjects are also presented in a book that can be purchased by anyone wanting to dig deeper into the matter.

Villa (right) and Chalet Cassel with the Educational Garden area in front.

Both static and audio-visual techniques are used in the exhibit along with changing displays, film presentations and lectures. Staff members normally can be consulted too. An additional part of the Center is an educational garden which makes a nature trail in the protected area itself unnecessary. Here one can get explanations of ecological requirements and the species composition of associated plants and animals. Emphasis is placed on the ecosystems and on the communities rather than on "beautiful" individual species.

Also in the Villa are two class rooms where comprehensive courses for 25-30 people can be held simultaneously; a library, 60 beds, a dining room, day room, kitchen, film theater, recreation room, laboratory, and offices.

The staff lives in the Chalet and another building. Working facilities for scientists have been improved in the Chalet in order to be able to intensify research in the Aletsch area. Laboratories and one or two bedrooms have been installed. The scientific work is under the supervision, coordination and assessment of the "Aletschwald Scientific Commission". For the support of this work and the scientific management of the Center, a natural scientist has been chosen as Director. In addition a fluctuating number of assistants is available. The Nature Reserve is supervised by two Aletschwald guards, by rangers and by foresters.

Use Possibilities

Due to its high elevation, the Nature Conservation and Study Center is only open in the summer from June to mid-October. During this period the exhibit can be visited by anyone. There is no set program of courses for the season. Individual weekly courses are offered by SBN for members and others on such subjects as biocenosis in the Aletsch area, flora in the Aletsch region, and the changing mountain landscape. In addition any institution that is interested in holding a course for a group in the Center can register to do so. Priority is given to universities, colleges and schools. Guided tours through the Reserve are given by the Center's staff. Course leaders who are not familiar with the area can obtain help from the Center's staff in the preparation of their courses.

Experience To Date

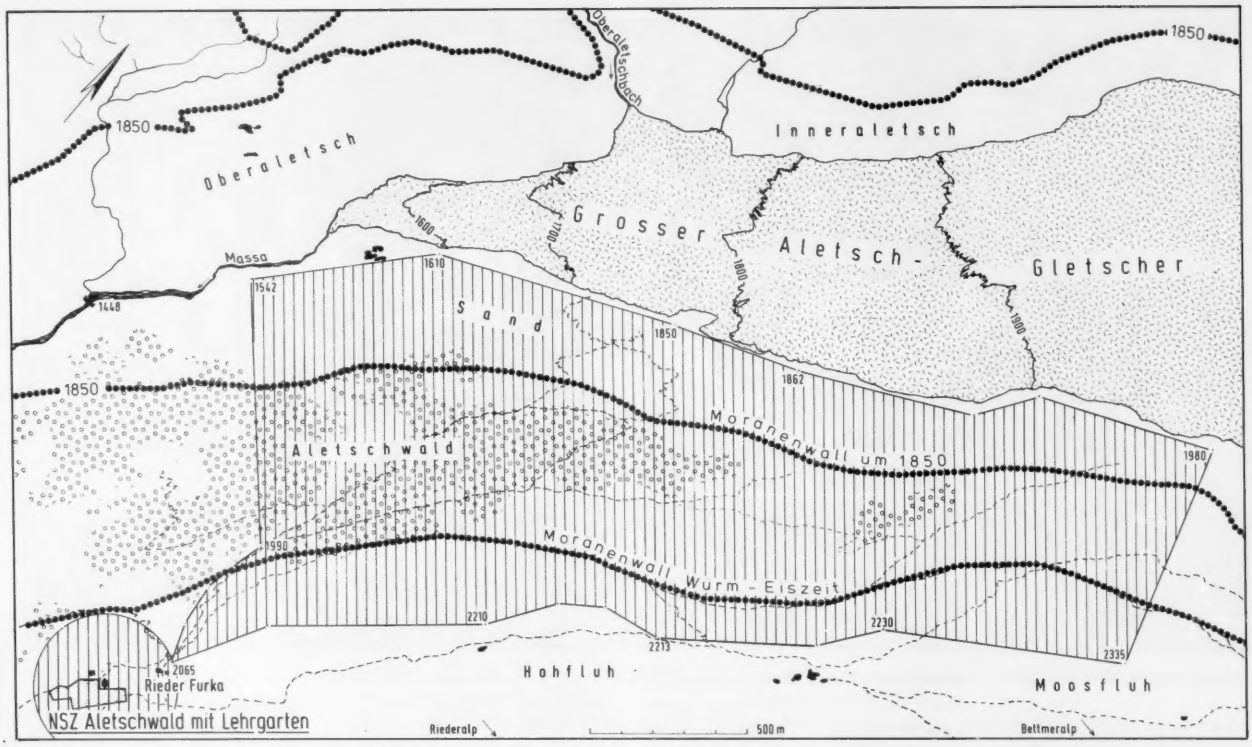
The combination of an information and study center has proven very workable. The exhibit offers a wealth of material for the various courses and helps the visitors to become aware of the courses being held at the Center. Often course visitors return at a later date with their families, or as a member of another group. The combined Center also is much more interesting and demanding for the personnel because the average course participant stays five days.

Data for Years of Operation 1976 to 1978

	1976	1977	1978
Visitors	13,513	13,008	13,600
Visitors/day	123	98	109
Excursions	—	70	40
Courses	24	38	35
Guests	620	1,000	720
Overnight Stays	2,655	4,300	3,600
Length of Season (days)	110	132	125

As the data show, the number of visitors fell slightly in the second year, but increased again in the third year. The number of guests, overnight stays and excursions decreased in 1978. Only three years can so far be evaluated. However, it can be shown clearly that the location of the Center and its short season with changeable weather conditions influence the frequency of visitation and that courses cancelled on short notice are difficult to reschedule. Courses of less than a four day duration are unsuitable due to the long traveling time to and from the Center.

For the Winter Season 1978-79 a smaller exhibit, as suggested by the author during the original planning stage, was prepared. This exhibit helped to make the Center known to the numerous winter guests of this ski paradise and promoted additional visits for the summer. The attraction of new members of SBN in connection with the exhibit and courses has been very successful.



A view from the Aletschwald over the Great Aletsch Glacier. Top: The Center (left) near the Aletschwald Nature Reserve (shaded).

Problems and Difficulties

The establishment of the Center has been generally well accepted by the people but some problems have developed in the last three years. Part of the local tourist industry and some mountain guides view the Center as competition, even though only course participants and scientists can stay overnight at the Center and the Center has made the region well known, both inside and outside the country. The mountain guides have been successful in preventing the Center's excursions from including the glacier, despite the fact that it is an essential part of the natural science excursion (see table).

The planning of a water pipeline to bring water from the glacier lake to Riederalp village through the north slope has created a serious dispute. Part of the concerned citizenry and SBN are against the project while another part favors it. Only when more water is available in the village can more profitable tourist projects be realized. The dispute has not yet been resolved and the work of the Center has been hindered because it depends on the local population for support.

The intensive winter sport activities present other problems. The Aletschwald region is renowned for powder snow skiing. As a result many native animals are disturbed and driven out of their sheltering cover. For them the resulting loss of energy in these high mountain regions seldom can be compensated, so that, for example, grouse *(Tetrao tetrix* and *Lagopus mutus)* are infertile the following summer. Their populations are thus additionally endangered. Skiers also cross the area of the educational garden in winter causing damage which, at the moment, cannot be prevented.

Outlook

The establishment of the Center and its concept can be positively viewed in every way. However, more intensive cooperation with the local population is important. Similar centers in less extreme locations should follow.

Hans-Dietmar Koeppel is a landscape planner and architect with METRON, a large private planning office which specializes in environmentally-related work. He lives in Switzerland at 5504 Othmarsingen. Photos by H.-D. Koeppel. The original German text was translated in English by Hanno and Pat Henke.

Secretariat of the SBN: Wartenbergstrasse 22, 4052 Basle, Switzerland. Secretariat of the Aletschwald Nature Conservation and Study Center: Postfach 128, 3981 Riederalp, Switzerland.

Carl Norbeck

Whalers Village: An Interpretive Museum in a Shopping Center

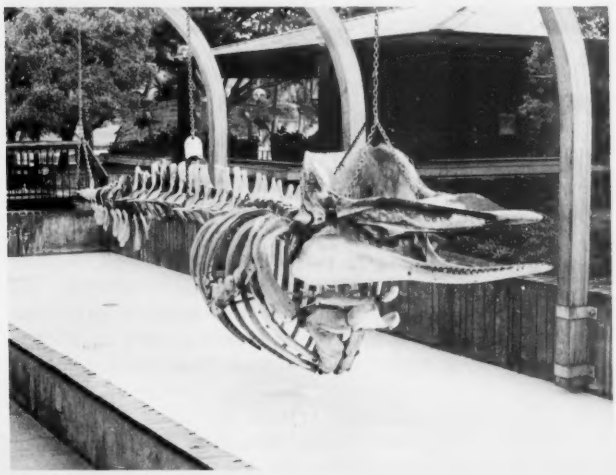
On the Hawaiian island of Maui, between the old whaling port of Lahaina and the modern beach resort of Kaanapali, lies an exciting outdoor museum. Visitors can stride across the world's oceans and continents on a ceramic tile floor map depicting the species and distribution of the great whales. They can walk alongside the skeleton of one of these huge marine mammals, and handle the harpoons and other artifacts of the old whaling era. Period photographs and quotations convey the epic elements of danger, courage, and cruelty. Pamphlets tell of the modern plight of the whales and promote their conservation. The sights, sounds, and smells of the nearby Pacific Ocean provide the backdrop for this park-like, multi-level project.

This evocative montage of past and present is not the product of the efforts of the U.S. National Park Service or of the Maui Historic Commission. It is an integral part of a modern shopping center: Whalers Village Museum and Shopping Complex. Whalers Village is the creation of a multinational corporation, Amfac, Inc., and a pioneering corporate precedent in preserving the cultural heritage of an area.

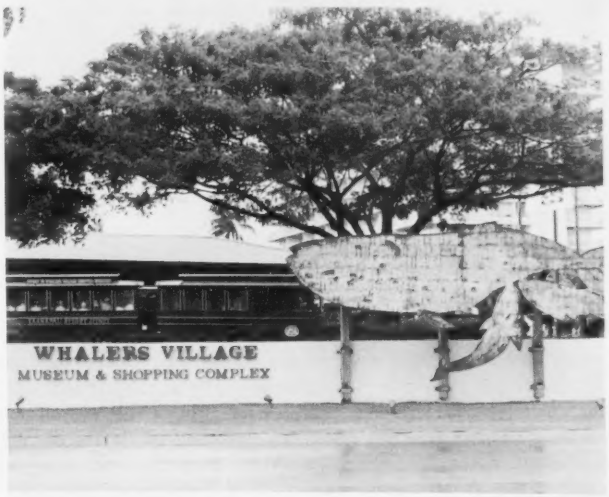
Interpretations

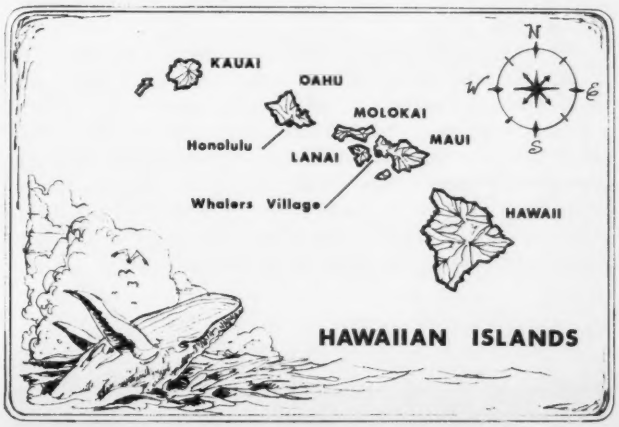
The Lahaina and Kaanapali area was the focus of the Hawaiian whaling industry during the mid-19th century. A land-based whaling station in its own right, it also provided a haven for New England whaling ships; one year there were 500 ships anchored in the sheltered waters off Lahaina.

Right: Entrance to Whalers Village with large sculpture of humpback whale nursing two calves. Below: Skeleton of 12-meter (40-foot) sperm whale suspended from boat davits over reflecting pool.



The intent of Whalers Village was not to re-create a New England village in Hawaii, but rather, to weave the inter-related New England and Hawaiian whaling history into a contemporary setting. Its architecture reflects the blocky, utilitarian style of the New England whaling vessels — so different from the schooners and clippers of that era. Its open, park-like setting is pure Hawaii — stirred by the trade winds and washed by the sea. From December through April the humpback whales, now under U.S. Federal protection as an endangered species, make their annual return to Maui and can be seen in their natural habitat off the Village. Other nautical impressions derive from the detailing of the guard rails, light fixtures, landscape furniture, and the museum casework.



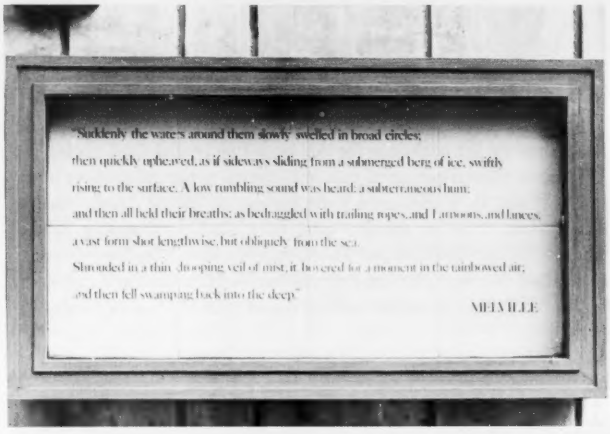


Whaling ship sculpture set amidst multi-level walkways and nautically-styled guardrails.

Whale vertebrae sculpture set in mini-plaza which opens onto the Pacific Ocean.

Whaleboat complete with mast and sail and oars surrounded by display cases and other nautical touches.

Display case describing ship's captain and his crew.


"Suddenly the waters around them slowly swelled in broad circles;
then quickly upheaved, as if sideways sliding from a submerged berg of ice, swiftly
rising to the surface. A low rumbling sound was heard; a subterraneous hum;
and then all held their breaths; as bedraggled with trailing ropes, and harpoons, and lances,
a vast form shot lengthwise, but obliquely from the sea.
Shrouded in a thin, drooping veil of mist, it hovered for a moment in the rainbowed air;
and then fell swamping back into the deep."
MELVILLE

Quote from Herman Melville capturing the drama and poignancy of the whale hunt.

This is the setting for more than 100 museum displays arranged in a sequence which provides visitors with a brief general knowledge of whale species and distribution and then carries them through the construction of whaling ships, setting out on a voyage, life aboard ship, the whale hunt, the kill, and the processing of the whale, as well as a series of illustrations and quotations depicting whale legend and mythology. All of these scenes are vividly illustrated on hand-crafted ceramic tile murals. In addition there is a display of scrimshaw (engraved whale ivory)—one of the few important indigenous American folk arts.

There is an added, subjective dimension to Whalers Village; it is not a static memorial linking past and present. Whalers Village has an ability to enlarge a visitor's appreciation of the natural world. Children especially sense the spell of Whalers Village, often pausing, enthralled, to gaze at or touch a memento of these great animals. The former manager of Whalers Village, Cymbre Ferguson, recognized the children's interest and wrote a book about it for them: *It's Whale Time at Whalers Village*. The spell cast by Whalers Village enlivens the world of the whales making them seem less a world apart.

The People

The developer of Whalers Village, Amfac, Inc., is a Honolulu-based global company. Among its subsidiaries is Fred Harvey, Inc., concessionaire at a number of U.S. national parks, including Grand Canyon. Amfac's Chairman and President, Henry A. Walker, Jr., credits the architect and curator of Whalers Village, Edward Carson Beall of California, with the origin of the concept of incorporating a whaling museum into the shopping complex. Beall notes that the example of this project has led to other thematic shopping complexes such as Seacliff at Huntington Beach, California, which was commissioned by Chevron Oil Company; there the theme is ocean- and shore-birds.

Recognizing Precedents

Historically, three consistent themes have pervaded national park objectives: nature preservation, historic preservation, and outdoor recreation. Today, an additional theme is gaining momentum: preservation of the cultural heritage of a nation or region. Traditionally, the task of achieving these objectives has fallen to government. Whalers Village dramatically demonstrates that the business community can also be effective in attaining these goals. It is a significant precedent. As others become aware of Amfac's skillful example at Whalers Village, they may be inspired to encourage similar actions elsewhere.

Carl Norbeck is Director of Applied Ecology at Thorne Ecological Institute in Boulder, Colorado, USA.

Robert E. Manning

Strategies for Managing Recreational Use of National Parks

National parks throughout the world are beset by a variety of management problems. These range from ecological problems such as threats to preservation of sensitive wildlife and fragile vegetation, to social/cultural problems of competing economic uses of parklands, to administrative/institutional problems of inadequate funding and manpower. Perhaps the most threatening of all problems, and at the same time the most paradoxical, is the adverse impact, both environmental and social, of recreational use of national parks.

Some thirty years ago Aldo Leopold, one of America's pioneering conservationists, predicted that the greatest threat to preservation of natural areas would come not from outside forces such as timbering, mining, grazing, or other economic exploitation, but rather from within by means of people visiting wild areas to reap their aesthetic, experiential, and recreational benefits. Leopold expressed this view in his now classic *A Sand County Almanac* in the passage:

> But all conservation of wildness is self-defeating, for to cherish we must see and fondle, and when enough have seen and fondled, there is no wilderness left to cherish.[1]

To an extent, Leopold's prediction has been borne out. Recreationists and tourists visiting the national parks have in many cases caused considerable environmental damage. Soils are compacted and eroded, fragile vegetation crushed, migration and reproductive cycles of wildlife disrupted, and water bodies silted and polluted. Visitors have had equally devastating impacts on themselves by reducing the quality of the recreation experience through crowding and congestion, and conflicting recreational uses.

Fortunately, we need not be quite so pessimistic as Leopold in viewing the situation today. Most national parks have largely retained their principal values due to development of the art and science of park management. Through dedication, creativity, research, and trial and error, park managers now have a variety of options to combat the environmental and social ills brought on by the common conditions of overuse and misuse of national parks.

Strategies and Tactics

The purpose of this paper is to review and synthesize the various approaches to recreation management in national parks and similar reserves. The focus is on management strategies as opposed to tactics. Strategies are defined as basic conceptual approaches to management, and relate directly to achievement of a desirable end or objective. Management strategies define different paths to preservation of environmental and recreational quality. Tactics are defined as tools to carry out various management strategies. As such, they have a less direct relationship with park objectives.

An example may serve to clarify this distinction. One basic approach or strategy to managing overuse of national parks is to reduce or place a limit on the amount of use allowed. Within this basic strategy, there are a number of tactics or tools which might be used, including permit or reservation systems, higher user fees, requirement of a minimum skill or knowledge level, and physical barriers to use such as fences or dense vegetation.

Strategies occupy a higher conceptual plane than tactics. As with the above example, one must first decide if limiting use is the most appropriate approach to meeting park objectives. Only after this decision is made should individual tactics be considered for implementation. Too often initial attention is centered on various management tools which may be familiar or administratively attractive without explicit regard as to how these tools relate to overall park management strategy and objectives, and how acceptable they will be to the public.

Classification of Strategies

The remainder of this paper outlines a classification system for strategies of recreation management within national parks. Three basic purposes are served through an exercise of this nature. First, park managers may become more explicitly aware of the variety of alternatives available to deal with recreation management problems. In nearly all cases, there is more than one approach or strategy to solving a given problem and all possible approaches should be given equal consideration.

Second, an organizational framework is needed to move park management along the continuum from an art to a science. Park management has made considerable progress in development of ideas, concepts and techniques. Organization and classification of this body of knowledge is essential, just as it is for the development of all sciences.

Finally, a framework of strategies is needed to more clearly examine the role of individual park management practices or tactics. The often multiple and sometimes conflicting purposes of management actions may become more obvious when viewed from within a greater strategic perspective.

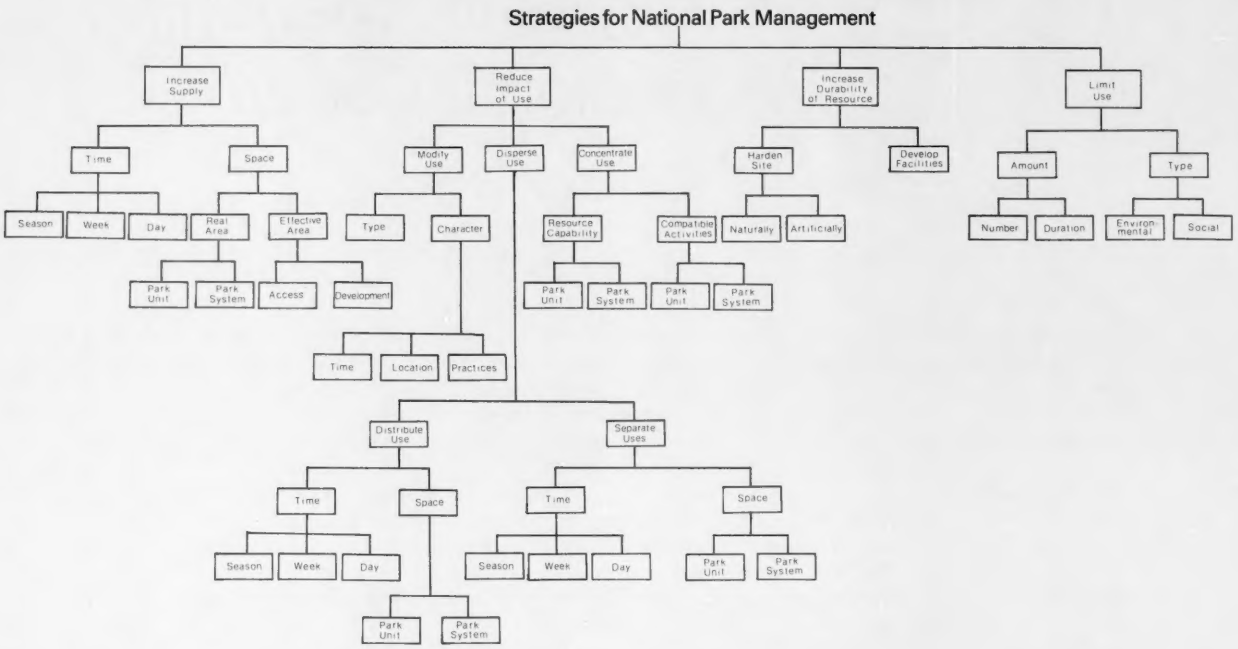
Increase Supply

Four basic strategies may be recognized for managing recreational use of national parks (Figure 1). Two of the strategies deal with the supply and demand aspects of recreation and park lands. One may approach management by increasing the supply of lands available for recreation or alternately by limiting the amount of use existing lands receive. The other two basic approaches treat the supply and demand situation as constant and focus on modifying either the character of existing use to reduce its adverse impacts or the resource to increase its durability.

Within the first of these basic strategies, increasing the supply of

1. Aldo Leopold, *A Sand Country Almanac*. The Oxford University Press, New York, 1949. Page 108.

Figure 1.



areas, there are several distinct sub-strategies. We may consider increasing supply in terms of time or space. With respect to time, research has demonstrated that use of national parks is typically highly concentrated in a small percentage of all potentially available hours. If some peak use can be shifted to lower use periods, then some of the pressure of overuse might be relieved. This might be accomplished through extension of traditional peak use seasons or encouragement of new off-season activities. Earlier opening and later closing dates and promotion of winter activities such as ski touring and snowshoeing are examples of how this strategy might be implemented. Some weekend use might be shifted to weekdays by such means as differential pricing, while daily use schedules might be expanded by lighted facilities, which are becoming more prevalent in outdoor recreation.

The more traditional way to consider increasing supply is through expansion of the area available for recreation. Here we may consider both real and effective area. Increasing the real area available for recreation refers to acquisition of additional hectares of parkland, and this can be done through either expanding an existing park unit or creating an entirely new unit within a park system. Effective area refers to managing existing units more intensively to provide additional opportunities for recreation. This can be approached from the standpoint of a higher level of development (e.g., providing more campsites) or increasing the accessibility of existing facilities (e.g., providing more or better roads and trails).

Limit Use

Reducing recreation demand or limiting the amount of use parklands receive is a second basic strategy for managing national parks. Again, several substrategies present themselves. An overall limit may be placed on all recreational uses. This limit may be approached indirectly through regulation of lengths of stay, in this way excluding as few users as possible, or more directly through simple imposition of use ceilings.

Alternately, managers may focus on limiting selected types of uses which can be demonstrated to have high impacts. Recreation uses with high environmental impacts should be limited or excluded where damage to park resources is apparent, and uses that are high in social impacts should be limited when the quality of the recreation experience declines due to congestion or user conflicts.

Reduce Impact of Use

A third basic strategy for managing recreational use of national parks treats demand and supply as fixed, at least in the short run, and focuses instead on reducing the impact of recreational use through modifying use patterns or activities. Use patterns might be altered with the idea of encouraging either more concentrated use or more dispersed use.

The philosophy behind the concentrated use strategy is to focus a large percentage of use on a small percentage of parkland. In this way, environmental impacts may be confined to small, intensively managed areas which have been selected originally for their high resource capability. Recreational use may be concentrated on small portions of each park, or selected parks from within a system may be chosen and managed to accommodate most use.

Recreation uses may also be concentrated on the basis of compatibility with each other. Users with like values and motivations may be grouped or concentrated together. Again, this may be done on the individual park unit level or by park system.

The strategy of dispersing recreation use relies on the philosophy of distributing use so that no one area receives damaging amounts of use. Managers may focus on distributing use over either time or space. As with supply, recreation use may be dispersed over time on a seasonal, weekly, or daily basis. It is probably more conventional to think of dispersing use over space or a wider geographical area. This can, again, be done on a park unit or park system basis.

Recreation uses may also be dispersed through separation of con-

flicting uses. As above, this may be accomplished on a temporal basis, through seasonal, weekly, or daily units of time, or on a spatial basis, by park unit or park system levels.

Modification of recreation activities is a third sub-strategy under reducing the impact of use. Selected recreation activities of user groups may have to be reassigned elsewhere or eliminated from the park environment altogether due to excessive environmental or social impacts. An alternative is to modify the character of recreation use. In this way potentially damaging activities might not have to be eliminated, but rather altered with respect to their timing (e.g., limited to the wet season), location (e.g., restricted to areas above treeline), or practices (e.g., elimination of woodfires).

Increase Durability of Resources

The last basic strategy of managing recreational use of national parks involves changes to the resource base. Resources may be hardened to bolster their resistance to recreational impacts. This may be done in a semi-natural fashion, through such means as planting hardier species of native vegetation, or in a more artificial way, through such engineering practices as surfacing heavily used sites.

An additional sub-strategy involves development of recreation facilities such as campgrounds, trails, and sanitary installations to serve as "lightning rods". In this way recreational use, and its concomitant impacts, are directed away from the resource base and to these developed facilities.

Conclusions

This paper has presented a classification of strategies for managing recreational use of national parks. The value of this material lies not in the classification system *per se*, for there are many possible factors upon which to base such a system. The principal value lies in the logical and comprehensive array of alternatives available to national park managers to deal with the environmental and social impacts of expanding recreation use.

Several conclusions may be reached based on this exercise:

1. Many alternative strategies exist to manage recreational use of national parks. For any given problem, there are likely several approaches to its solution, and managers would do well to give explicit consideration to a variety of alternatives rather than rely on those which are familiar or administratively expedient.

2. A related conclusion is that there is probably an overemphasis on the basic strategy of limiting recreation use because of its ease of implementation. It should be remembered that most national parks and equivalent reserves have been established for the dual objectives of preserving resources and, to the extent possible, making these resources available for public appreciation and enjoyment. Excluding people from national parks does little to fulfill this second objective. Other approaches should be explored more fully.

3. Most strategies for managing recreation involve managing visitors rather than natural resources. The preservation objective of national parks precludes large scale manipulation of natural and cultural resources. This leaves visitor populations as the principal management target. The implication is that managers will often need more accurate and detailed information on recreation use and users than presently exists. An additional implication is that park management personnel with expertise in the social, behavioral, and communication sciences are needed to the same degree as natural and biological scientists to ensure preservation of national parks.

4. Individual park management tools or tactics can often be seen to serve several strategic purposes. For example, the potentially powerful tool of visitor information and education services can effectively increase the supply of parks by contributing to awareness of off-peak use opportunities, can limit the use of congested areas by shifting visitors to lesser used sites, and can reduce the impact of use by making visitors more knowledgeable of appropriate hiking and camping practices. The various strategic uses of park management tools should be explicitly recognized before they are implemented so as to gain multiple benefits where possible and avoid unwanted side effects where potential.

5. A general hierarchy may be recognized with respect to desirability of the four basic recreation management strategies. Increasing pressure for outdoor recreation very often warrants expansion of the supply of park areas as a justifiable and preferable alternative. Unfortunately, it can also be difficult and costly to implement. Reducing the impact of recreation use is also a desirable course of action as it slows or checks deterioration of the quality and value of parklands while at the same time retains their availability to the public. Limiting recreation use can be justified only when all other reasonable alternatives have failed or been ruled out. Restrictions on entry to national parks do not serve the two-fold objectives of these areas and will in the long run weaken broad based support for national park preservation. The final strategy of increasing the durability of park resources may be necessary and desirable in limited areas and instances. When viewed in conjunction with basic national park objectives of resource preservation, however, this strategy is unacceptable on a large scale basis.

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PARK TECHNIQUES

Static Pile Composting — A Waste Treatment Alternative

James C. Patterson and Carole Sue Rodgers

Paralleling the Potomac River for approximately 185 miles (nearly 300 km), the narrow ribbon of the Chesapeake and Ohio Canal National Historic Park extends northwest from Washington, D.C., to Cumberland, Maryland. It features the old canal and its towpath, which were built between 1828 and 1850, and ceased operation in 1924. As a park, the canal route has become one of the nation's most popular areas for hiking, picnicing, cycling, canoeing, birdwatching, and other outdoor activities. Size and location have brought problems of their own, but recently the Park's most pressing problem has been that of waste disposal.

Until 1972 pit toilets had been used to accommodate visitors in the more frequently used areas. At that time the Park substituted portable chemical toilets — more than 80 in all — for the pit toilets in order to comply with environmental quality standards. Due to the high water table and proximity to the river, there was concern that the pit toilets were a source of contamination of the Potomac.

Under the new system, waste from the chemical toilets was collected in pumper trucks and transferred to sewage treatment plants operated by several small towns near the park.

Then, in 1975, the Park was informed that the municipal treatment plants serving the Piedmont District of the C&O Canal would no longer accept the waste. Apparently there was some interference with the biological processes of the treatment, possibly due to the disinfectants used in the chemical toilets and simply too much waste to treat. Consequently, another means of waste treatment was sought.

Alternatives were suggested, such as closing the towpath, or transporting the waste to municipalities farther away, or composting. The option of composting was selected as the most desirable.

The Composting Solution

Composting, a naturally occurring phenomenon resulting from aerobic microbial activity, has been vastly improved upon by man. Scientists at the U.S. Department of Agriculture's Science and Education Administration in Beltsville, Maryland, had developed the static pile composting system, and effective techniques to treat filter cake sludge produced at the City of Washington's Blue Plains Waste Treatment Plant. Filter cake sludge is produced by vacuum extraction of liquid leaving a substance that is approximately 20 percent solids. This material is significantly different from the Park's raw waste which is only 2 to 3 percent solids.

The park's Piedmont District staff was skeptical about the ability of the static pile composting system to handle their raw liquid waste with its low solids content. However, with their full support the static pile technique was modified and several additional organic bulking materials were added to absorb the excess liquid. Gradually the technique was perfected. By June 1976, the composting program was effectively treating this waste material, and had become a simple and economical means of rendering raw sewage and other material into an organic soil conditioner. The system has received a completely favorable response from the Park staff and NPS Public Health personnel and soon will be extended to the C&O Canal's Allegheny District.

The System

Static pile composting requires minimal equipment and energy. Here is how it works:

- First, a number of organic bulking materials (sawdust, woodchips, and previously composted material) which are used to absorb the collected waste are thoroughly mixed and formed into a saucer-like configuration to receive the liquid waste. Other organic bulking materials could be substituted, of course.
- Waste is then pumped onto this mixture and the liquid portion usually is absorbed within 30 minutes.
- Meanwhile, adjacent to the mixing site, a mattress for the static pile is prepared. At the C&O Canal a mattress approximately 3 meters (9.5 feet) in diameter and 30 cm (12 inches) thick is fabricated of woodchips and/or compost.
- A loop of perforated 4-inch (102mm) plastic pipe is placed within this mattress and connected to a pipe leading to a ⅓ h.p. blower which serves as an air suction pump. A damper helps regulate the flow of air drawn through the pile by the blower.
- Now the combined organic bulking materials and waste are thoroughly mixed and transferred onto the mattress. On the mattress the completed mixture forms a cone-shaped pile.
- The mixture is covered with a blanket of compost and/or woodchips which is 30-45 cm thick. This insulates the pile and maintains necessary composting temperatures which result from the aerobic microbial activity. The blanket also decreases odors produced during the early stages of the breakdown. For colder climates a thicker blanket is required for satisfactory composting, and a thinner one, of course, for warmer climates.
- Finally, a timer is set to regulate the blower, in a selected on-off cycle. During the "on" cycle, air is drawn through the pile and exhausted through a filter pile of old compost which absorbs any unpleasant odors.

Ensuring Proper Decomposition of the Waste

Careful monitoring of the pile is essential to ensure proper composting. Oxygen and temperature should be recorded during the initial phases. A range of 5 to 15 percent oxygen is desired in order to maintain optimum microbial activity. This will generate the necessary levels of heat for efficient composting and destruction of harmful pathogens. Temperatures of 55°C (131°F) and above will kill pathogenic organisms. Indeed, 55°C is the critical minimum temperature, and normally it is reached within 3 to 5 days. The temperatures should range between 60-75°C (140° to 167°F) for a period of several weeks to ensure composting within all portions of the pile. Temperatures as high as 80°C (176°F) are often reached within the first 10 days. The compost pile will maintain the very high temperatures for only a few days. It will slowly decrease to a

1. Bulking materials of woodchips, sawdust and previously composted materials are mixed.

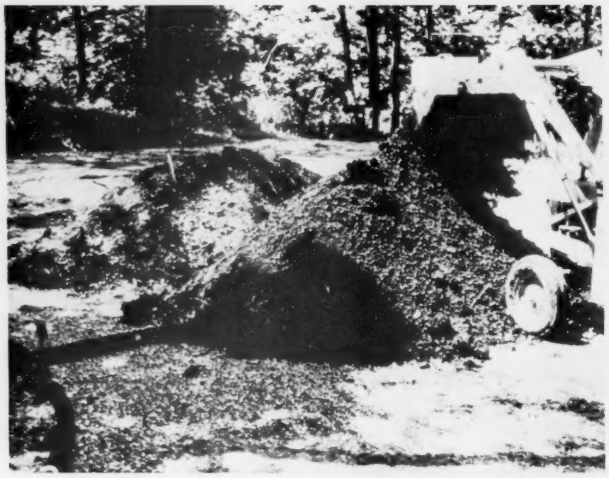
2. Formed into a saucer, the bulking materials receive the waste. It is absorbed in about 30 minutes.

3. A mattress of woodchips is laid down and a perforated plastic air suction pipe is put into position.

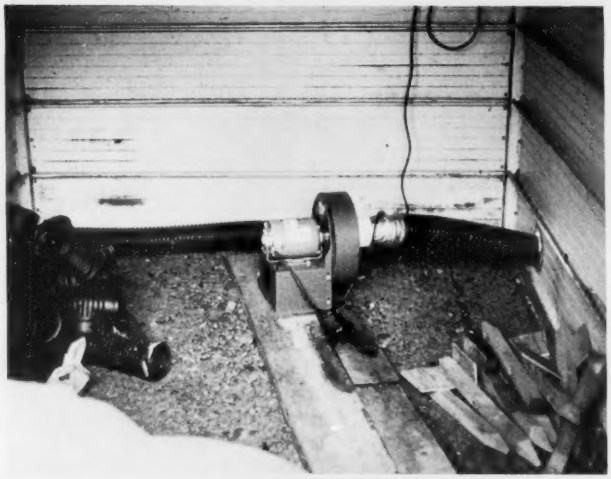
4. The finished mattress, ready to receive the waste mixture for composting.

5. Mixing the bulking material and absorbed wastes.

6. The thoroughly mixed wastes and bulking materials are loaded onto the mattress.



7. A blanket of woodchips and previously composted material is placed over the pile.

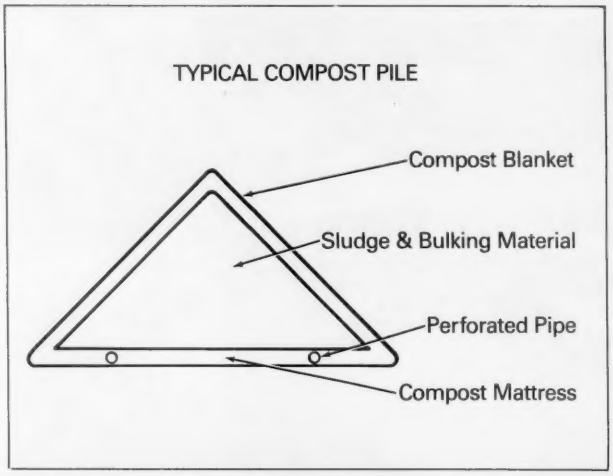


8. A ⅓ h.p. motor and blower pull air with its vital oxygen content through the pile.

9. The air flow and oxygen supply can be regulated with this damper valve (arrow) as well as by on and off cycles of the motor.

10. Park employees monitor the composting pile for temperature and oxygen content.

11. Finished compost pile, half dismantled. This material is now ready for use as a soil conditioner or mulch on ornamental plants, trees, shrubs, etc. It should not be used on food crops, of course.



level of about 60°C (140°F) where it stays for several weeks. At these high temperatures the decomposition of the waste is hastened. The entire process requires about 4 weeks.

Heat is produced as a result of thermophilic microorganisms that feed on the carbon in the organic matter. These organisms utilize the nitrogen found in the waste and the oxygen as their energy sources.

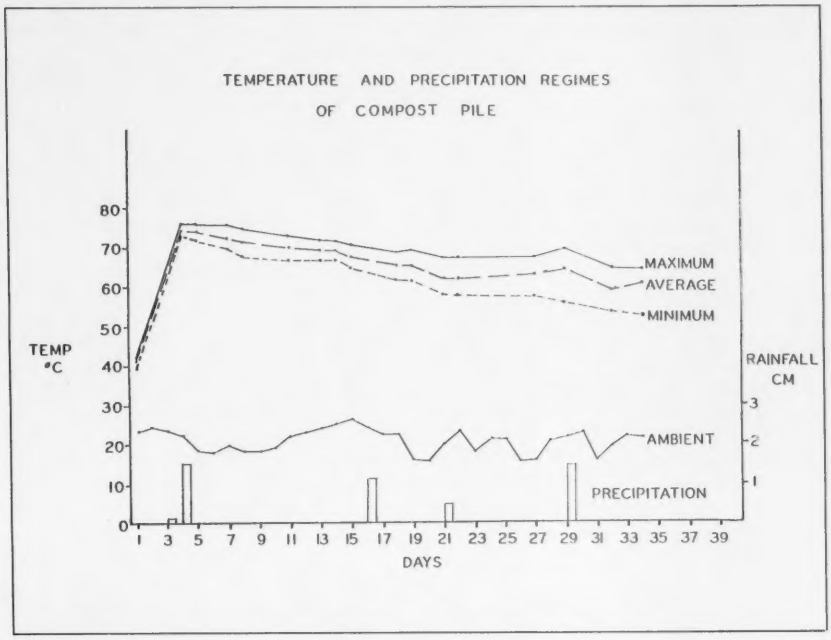
The Product

Varying amounts of macro-nutrients (nitrogen, phosphorus, and potassium — usually lowest in nitrogen and potassium) and micro-nutrients are found in compost, making it a low analysis fertilizer. Less varying is the pH of the compost which is usually around 6.6, or slightly acid. Both of these characteristics favor its use as an organic matter resource. In addition, use of compost dramatically improves the physical properties of soils.

The Composting Site

The entire composting site at the C&O Canal covers less than 0.40 ha (one acre). This includes a pad of approximately 30 m × 45 m (100 × 150 feet), a diversion ditch which surrounds the pad, and a sump to collect any runoff or rainwater. Each pile is constructed of about 9 cubic meters (11.8 cm yds.) of sawdust, 9 m^3 of woodchips, 3 m^3 (3.9 cm yds.) of old compost, and contains 3800 to 4900 liters (1000 to 1300 gals.) of raw sewage. Depending upon the number of visitors, the C&O Canal composts between 30,300 and 132,500 liters (8000 and 35,000 gals.) of waste per year. The system was designed to handle almost 400,000 liters (105,000 gals.) per year. So far the operation has required no more than 2 man/months per year for complete operation of the composting activities and, of course, the Park is completely self-sufficient in the handling of its wastes..

U.S. Department of Agriculture's operation at Beltsville is on a much larger scale than that at the C&O Canal. Approximately 45 to 90 metric tons are composted every day in Beltsville and this requires a much greater area and much more equipment. Much of the technology used at the Park was adapted from this operation.



The Flexibility of the System

Static pile composting has proved to be a highly adaptable and flexible system which can meet many needs simply by varying the equipment, the organic materials used and the size of the working area. The C&O Canal system is small. However, it could be further reduced in size to handle an even smaller volume of waste. Conversely, similar systems have been proposed to handle the production of sewage from very large cities. Obviously, each location would require system modifications.

In short, the static pile composting technique has and is continuing to receive wide consideration as a waste treatment alternative due to its low costs, wide flexibility with regard to size and geographical locations, and its environmental acceptability. Finally, the organic product generated is valuable for many uses not associated with the growing of food crops.

James C. Patterson and Carole Sue Rodgers are agronomists with the Ecological Services Laboratory of the National Capitol Region of the U.S. National Park Service, 1100 Ohio Drive, S.W., Washington, D.C. 20242

What To Do About Immersion Hypothermia

Cameron Bangs, M.D.

A young couple rafting down the Clackamas river in Oregon in April suddenly had their rubber raft overturned by a partially submerged rock. The man was quickly able to get to shore but his wife, while clinging to the rubber raft, continued on down stream. She was unable to get close enough to shore to allow the frantic husband running alongside to help her out of the water.On several occasions he waded into the icy water attempting to grab her, but each time the rapid current continued to pull her down. Initially she was quite active, yelling and struggling to help herself. After 15 or 20 minutes she was barely able to hold on to the raft, and was bounced from rock to rock, sometimes going under water. Further down stream her husband could see a point of land jutting out. An eddy current looked like it might pull the raft close enough to shore to reach her. He charged through the bushes and briars to get ahead of the raft, waded out waist deep and was just barely able to reach out, grab her pantleg, and pull her into shore. As he pulled her onto the rocky beach he sat down and breathed a sigh of relief because this long chilling episode was over. But was it?

When one has been pulled from ice water the danger is definitely not over and the chances of survival still depend upon the proper actions. Numerous people have been removed from ice water only to die within the next few minutes, because of avoidable errors. Humans are not cold water or cold weather animals. We are physiologically a tropical animal. Recent studies have shown that much of our instinctual behavior in the cold will actually cause us to die faster. This article addresses itself to the specific question of what to do immediately after pulling someone out of the cold water, to prevent unnecessary deaths.

Recognition Of Hypothermia

Immersion hypothermia should be considered in all cases of accidental involuntary immersion. When water temperature gets to 50° F. (10° C.) or below hypothermia may occur in a very few minutes. For practical purposes hypothermics can be divided into two groups, those with body core temperatures above 90° F. (32° C.) and those with a body core temperature below 90° F.

Above 90°F. (32°C). These victims will complain of being very cold, probably be shivering quite violently and may be slightly incoordinate, but should still be able to move around relatively normally. They may be lethargic and slow to respond but they should have near normal thinking processes and be able to answer questions reasonably well. They should certainly be oriented as to who they are, where they are and what time it is. With core temperatures of 90° F. (32° C.) or above all should survive.

Below 90° F. (32° C.). At this stage they definitely have difficulty with muscular activities. They are uncoordinated, will probably stumble if allowed to walk and cannot perform any meaningful physical task. If cold enough their muscles may be quite stiff, even similating rigor mortis. Mentally they may be quite confused, lethargic, withdrawn, unable to speak sensibly and be quite disoriented as to their whereabouts. They will be unable to care for themselves and may insist on doing the wrong thing. As body temperature approaches the low 80's or high 70's, they may drift into unconsciousness and this combined with stiff muscles may cause them to appear dead. If not properly handled, statistics show that up to 65% of this group (90° F. or below) will die during the rewarming.

Immediate Care

Do not allow the victim to exercise. After a victim is removed from cold water his body core temperature will continue to drop for about 3° C. This "after-drop" may be lethal. The "after-drop" is a result of the coldest blood, located in the extremities, being pumped back to the core. When one is allowed to exercise, walk, struggle or generally move around the flow of cold blood from the extremities back to the heart is increased due to the muscular action on the blood vessels.

After being removed from cold water, the victim should lie as still as possible and should not stand or walk even a few steps. If the victim needs to be carried, use a stretcher if possible, or if not, carry in such a way that he does not need to struggle to hold on. When removing the victim's wet clothing, do it passively without his muscular help. Do not rub or massage the victim.

This muscular *inactivity* should continue until the core temperature starts to rise. Time will vary with the situation from twenty minutes to an hour. A rule of thumb would be to keep the victim inactive until he shows some sign of improvement.

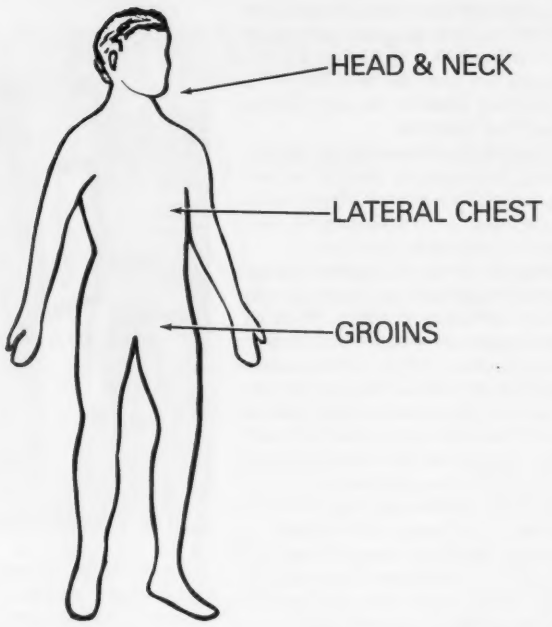
Handle the victim gently. When victims die of hypothermia they generally die of heart irregularities with ventricular fibrillation being the most common. The hypothermic heart can be made to fibrillate by rough handling of the victim. If, in your exuberance to do something, you carelessly grab the victim, bounce him along while you drag him up the beach, flop him over to remove clothing, you may *kill* him. The victim should not be jostled, particularly in the chest area and should be handled very gently. In carrying a victim on a stretcher he should not be set down abruptly.

The extremely hypothermic victim should be handled as gently as if had a broken neck. Closed chest massage, as performed in cardiopulmonary resuscitation, will cause a hypothermic heart to fibrillate if it is not already doing so.

Remove wet clothing immediately. The "after-drop" will be increased if wet clothing is allowed to remain on the victim, because of the cooling effect from evaporation of the water. Therefore, one of the most important immediate treatments is the removal of the victim's wet clothing. This should be done gently to avoid muscular exertion, but should be done as rapidly as possible. Dry clothing should replace the wet clothing. If several rescuers are present they can all contribute dry clothing to the victim. If no dry clothing or blankets are available there is some advantage to wringing out the victims clothing, particularly wool, and then putting them back on. If dry clothing is not available, wrap the victim in a plastic or other waterproof material, since this will slow down evaporation heat losses. This rescue technique is used in England where victims are placed in plastic bags for transportation to warming facilities.

Protect the victim from the wind. Wind will cause great increase in rate of evaporation and heat loss. The victim should be protected from the wind by windproof clothing, shelters, or the use of rescuers' bodies. Remember that rain gear makes a good wind barrier. This is particularly important in helicopter evacuation where a 100 mile an hour wind may be generated from the rotor wash. If immersed victims are to be picked up by helicopters they should be carefully wrapped in windproof material, especially the head and neck.

Do NOT give hot liquids by mouth. When hot liquids are given by mouth there is a pharyngeal reflex which increases the blood flow to the skin and the extremities. This causes an increase in temperature "after-drop" due to shunting of cold blood back to the core. There is very little heat provided by a cup or two of hot liquids given by mouth. Therefore, there is little advantage to giving hot liquids by mouth, and they may be harmful. If the victim is only mildly cooled there is probably no danger from hot liquids but do not give them to the severe hypothermic. Alcoholic beverages have a similar effect, definitely have no value, and should *not* be given. Alcohol is erroneously thought to have a warming effect because it makes the skin feel warmer. It does this by increasing warm blood flow to the skin. Unfortunately, the body heat transferred to the skin is more easily lost to the environment. The victim simply dies faster.



Rewarming the victim. There is controversy as to which is the best way of rewarming victims from cold water immersion. The British, who have extensive experience with cold water immersion, recommend submerging the victim in a tub of hot water at 110° F. (44° C.). The advantage of this technique is that the "after-drop" would be avoided or decreased because of the rapid rewarming. But it would be rare indeed to find a tub of hot water beside an icy stream or ocean so this discussion may be only academic. There is also a growing school of thought which recommends against hot water immersion because of the possibility of causing shock and increasing the "after-drop". All of the answers to this question have not been discovered.

At this point, I would recommend gentler rewarming as the best first aid technique. Gentle rewarming would best be carried out by applying heat from hot water bottles, heating pads, warm stones, etc. to the three areas of least insulation from the core including, 1) inguinal area or groins; 2) lateral chest; 3) head and neck. While doing this the entire body should be covered with blankets, dry clothing or sleeping bags to prevent further heat losses.

The second choice would be to cover the victim entirely with heated blankets.

Providing heat from another living body is an effective way of gently rewarming someone. This would include removing the clothing of both the victim and the rescuer and wrapping them both, skin to skin, in a sleeping bag or blankets. Putting the victim between two rescuers would be even more effective. Building a fire, of course, to provide radiant heat is another source of gentle rewarming. With an open fire a radiant reflector placed behind the victim would increase the effective heat received.

Remember to decrease the insulation, i.e., clothing, blankets, when trying to warm someone by radiant heat, from fires, heat lamps, etc.

Evacuate to a medical facility. All victims of immersion hypothermia should be carefully evaluated and probably observed overnight in a medical facility. There are late complications such as pneumonia, heart problems, etc., which may occur.

Advanced Life Support

Intravenous therapy. If advanced life support is available intravenous volume expansion with fluids is of great value. (The IV volume will help maintain blood pressure and decrease the "after-drop".) Veins of hypother-

DO

- Handle the victim gently
- Remove wet clothing immediately
- Protect the victim from the wind
- Rewarm the victim by applying external heat slowly
- Always have the hypothermic victim evaluated at a medical facility.

DON'T

- Do not give hot liquids by mouth
- Do not give alcohol
- Do not allow victim to move about, walk or struggle
- Do not stop resuscitative attempts until the victim has been rewarmed and preferably evaluated at a medical facility

mic victims will be hard to find so go for the big ones at the elbow. A small amount of heat may have to be applied to bring out the veins. Fluid should be given as rapidly as possible for the first 200 to 300 cc then slowed to give 1000 cc in the first hour. Lactated Ringer's is probably the best solution, but any standard intravenous fluid is helpful.

Even though these victims may be acidotic, intravenous bicarbonate should be used cautiously or probably not at all. Rapid correction of the acidosis is felt to be harmful, since it may lead to ventricular fibrillation.

Managing the airway. If hypothermia gets severe enough the patient may lose consciousness and have difficulty breathing. When advanced life support is available there are some specific precautions. If the airway seems obstructed, the neck should be properly positioned in the usual manner as recommended by the American Heart Association. It is very dangerous to perform endotracheal intubation (tube in airway) on these people since it may cause ventricular fibrillation, and should be done only as a last resort. If intubation is carried out and ventilatory assist utilized, the patient should be ventilated slightly slower than usual. If the patient is overbreathed (hyperventilated) there is danger of correcting the acidosis too rapidly, causing ventricular fibrillation.

Oxygen is always of value in these victims and, if available, should be utilized.

If mouth to mouth resuscitation is required it should be done in the usual manner at normal recommended rate.

Epilogue

As the young man pulled the woman up on the rocks, he noted that she was mumbling very slowly and incoherently. She could not assist him at all in moving her and she seemed to have a very blank expression. He sat down for a few moments to catch his breath and rest, and then decided to go for help.

He had to go two or three hundred yards through heavy brush and then up a fairly steep embankment to a road. He tried to flag down the first two cars but they refused to stop. The third car stopped, agreed to go for help and sent one person back with the young man to the victim.

When they reached the water she was not on the rocks and at first he thought he had become confused going through the bushes. He finally decided that this was the spot and she must have moved. Looking downstream there was a small trail leading through the thick underbrush. The two of them followed this about ten yards where they found her lying face down, dead.

Dr. Cameron Bangs of Oregon City, Oregon, is an enthusiastic climber and outdoorsman who is well known for his interest in cold related injuries such as hypothermia and frostbite. This article was adapted from the February 1979 issue of OFF BELAY, The Mountain Magazine, to which he is a frequent contributor.

Free-Standing Portable Display

A free-standing, 3-panel portable display is used to meet a variety of visitor information needs at Crooked Creek State Park in Pennsylvania, USA.

The panels are made of ¼-inch (about 6 mm) plywood and framed with wood strips for added rigidity. The panel size is 2 feet × 6 feet (about .61 m × 1.83 m). The 3 panels are joined with short piano hinges.

The display will stand by itself when folded into a triangular shape or when partially opened. When fully open it must be placed against a wall or braced. I. can be disassembled easily by removing the hinge pins.

As used at Crooked Creek, the display contains a map lighted with 6-volt battery power, and several mounted bins from which various pieces of park literature are dispensed.

This item was originally published in *Grist* (Vol. 22, No. 1), a publication in the Park Practice Program of the National Park Service and the National Recreation and Park Association.

Stump Bench

If you can't remove a stump that mars a visitor area why not convert it into a park bench?

James Montavon did just that at Russell Forest Preserve in DeKalb, Illinois, USA. Two cuts with a chainsaw were required: one to square off the top on which a seat was nailed, another to make a lengthwise groove for the backrest.

This useful idea also was taken from *Grist*, Vol. 22, No. 1.

Gentle Persuasion

This sign stands at Corrieshalloch Gorge, a National Trust property in northwestern Scotland. Photo: Gordon Fredine

DANGER
As the ledges overhanging the gorge are liable to give way, on no account should the fence be crossed.
Children and dogs must be kept under control.

BOOKS & NOTICES

In the Wake of the Tourist, Managing Special Places in Eight Countries, 1978, Fred P. Bosselman, The Conservation Foundation, 1717 Massachusetts Avenue, N.W., Washington, D.C. 20036 USA. 278 pages, hardback. U.S.$15 plus $1.50 domestic postage, $3 foreign.

Based on the findings of a team of researchers, the author examines many facets of tourism and their impacts on environmentally sensitive places in Japan, Mexico, Israel, France, Germany, England, the Netherlands and Australia. An interesting variety of locations are studied, from Jerusalem and its proliferating hotel problems, to the city of Amsterdam and its parks and youth gatherings, to England's Lake District, Mt. Fuji, Ayres Rock in the outback of Australia, and several more. If there is a common denominator, it is the conflict between increasing use and the preservation of resources people flock to see.

Mr. Bosselman is an attorney with a special interest in land use planning and people management, and with a sensitive appreciation for natural and cultural values. It is a book requiring careful study rather than reading for pleasure. If you were interested in Budowski's and Haulet's articles on tourism in PARKS Magazine (Volume 1, No. 4 and Volume 3, No. 3, respectively) Bosselman will take you many strides forward in this important field. He is to be commended for his final guarded optimism for future balance despite the gloomy evidence to the contrary revealed in this thoughtful book. —*Gordon Fredine*

Australian Endangered Species, Mammals, Birds and Reptiles, 1978, Derrick Ovington, Cassell Australia Limited, 31 Bridge Road, Stanmore, New South Wales, Australia. 183 pages. About $20 in Australia.

Considering the vastness of the Australian Continent, its comparatively recent settlement by Europeans (since 1788), and its relatively sparse human population (only 14 million), Australia provides a clear case history of how mankind can and does upset the natural scheme of indigenous life. This is not an indictment of Australians any more than environmental abuse can be an indictment of humans wherever they may live. On the positive side, this book clearly shows that there is an awakening of responsibility and a compelling need for action to offset the dangers to nature that man has unwittingly caused.

Prepared by the Director of the Australian National Parks and Wildlife Service, this handsome book carefully and honestly reviews the effects of human exploitation of a new land, and in so doing sets the stage for the conservation of its unique natural qualities. The book was written primarily for Australians, but it also challenges people of all nations to recognize, in time, what must be done to offset damage to the world's natural heritage.

Individual reviews discuss 43 species of mammals, birds and reptiles believed to be threatened, and in addition thoroughly covers the history of events leading to the present impressive governmental and private programs designed to preserve the outstanding resources of nature in and around the Continent.

The book is lavish in photographics (mostly in excellent color) and artistic renditions of the species in trouble. Set in very readable 8 and 10 point type in the Palatino face, it indeed is a book Australians can be proud of. —*G.F.*

Park and Recreation Futures in Canada: Issues and Options 1976. Canadian Outdoor Recreation Research Committee. Ontario Research Council on Leisure, 77 Bloor Street West, Toronto, Ontario M7A 2R9 Canada. Separate editions in French and English, 209 pages, duplicated. Canad. $6.00

Does your crystal ball need polishing? Do you find that the future "usually arrives before we are ready"? Then this report of the Futures Seminar held in January 1976 by the Canadian Outdoor Recreation Research Committee of the Federal-Provincial Parks Conference may be just what you need. It is a collection of thoughtful papers given at the seminar, with selected thumbnail comments by other participants, covering (1.) the seminar's terms of reference, (2.) why we need to consider the future, (3.) the techniques of forecasting, (4.) what the future demands might be, (5.) the "symptoms" of future trends, and (6.) some conclusions. A comprehensive list of reference is included.

Colin K. Campbell of British Columbia contributed an important paper in addition to providing insights into the first two subjects. His conclusions section is particularly revealing, in which he says "Our ability to deal with the future will be directly related to our ability to manage ourselves, and include the future in our management strategy."

Given the fundamental impossibility of seeing into the future precisely, he manages to humanize the whole speculative effort by suggesting guidelines for future advances in this field, implying at the end that to do so requires "Someone in your agency who is shielded from immediate reactive tasks and pressures to consider future agency roles," but also asking "does your agency spend as much time dealing with future challenges as it does defending past actions?"

Read this if you have a serious interest in planning for the future of parks and recreation while honestly admitting you probably will never know how right or wrong you will be. —*G.F.*

Haleakala, The Story Behind the Scenery. 1979, Jim Mack. K.C. Publications, P.O. Box 14883, Las Vegas, Nevada, 89114, U.S.A. US $3.00 paper; Add $1.50 for surface postage, 48 pages.

Haleakala National Park, on the island of Maui, is the place "where the sun dwells," a place where spectacular and unusual forms of life, weather and geology come together in infinite variety. The book reviews all aspects of the sleeping volcano's nature, history and tradition with splendid photos and sensitive text.

This is the 22nd and most recent book in this well-known series on units in the US National Park System.

Atlas of Environmental Dynamics — Assateague Island National Seashore. 1977, Robert Dolan, Bruce Hayden, Jeffrey Heywood. National Resource Report No. 11, National Park Service, published in cooperation with the University of Virginia, Charlottsville, Va. 40 pp., 3 foldout maps. Free.

Barrier islands, of which Assateague is one, are constantly changing. Dunes come and go, inlets open and fill, beaches build and recede, all in response to the relentless pressure of tides, currents, surf, storms and the wind. In clear text, simple diagrams and maps, the authors discuss these physical processes in a way nonscientists can easily understand, and offer brief notes for management.

Tropical Forest Problems

In response to the growing concern about the quickening pace of tropical forest destruction throughout the world, the US Department of State and the Agency for International Development co-sponsored a 3-day conference in June 1978 to begin to review this pressing global problem. The conference brought together over 100 scientists, goverment and industry officials and environmentalists and resulted in a series of practical recommendations for US action. The *Proceedings of the US Strategy Conference on Tropical Deforestation,* US Department of State, US AID, June 12-14, 1978, Washington, D.C. is available without charge from Bill L. Long, Office of Environmental Affairs, Room 7820, Department of State, Washington, D.C. 20520.

Rainforest Conservation

In recognition of the problems facing tropical rainforests, the Sierra Club's Earthcare Center is offering a slide and tape cassette program on this subject in English for US $5 rental or US $50 purchase. A Spanish language version is being prepared. Also available from the Club's Earthcare Center is a Fact Sheet on Tropical Rainforests in English and Spanish. Single copies of the Fact Sheet are available, free, from the Sierra Club Earthcare Center, 800 Second Avenue, New York, N.Y. 10017, USA.

14th International Seminar on National Parks and Equivalent Reserves

Thirty-six participants from all over the world will take part in this year's International Seminar beginning on July 31 and continuing through August 28. One hundred thirty two applications from 60 countries were received, and the Seminar is fully subscribed.

Candidates for the 15th Seminar, to be held in mid-1980, are urged to write to the Director to indicate their interest in reserving a position. Cost for the Seminar is approximately US $2000, plus personal expenses and travel to and from the Seminar. A working knowledge of English is a prerequisite. The address to write is:

Tom D. Thomas, Director
International Seminar on National Parks
School of Natural Resources
The University of Michigan
Ann Arbor, Michigan 48109, U.S.A.

Since 1965 a total of 426 members of professional staff engaged in nature reserve work in 84 countries have attended these seminars which are sponsored by the US National Park Service, Parks Canada and the School of Natural Resources of The University of Michigan.

The 14th Seminar will include visits to Jasper National Park in Alberta, and Fort Langley National Historic Park in British Columbia in the west of Canada. The group then will move to the USA for studies at Olympic National Park in the state of Washington, City of Refuge National Historic Park and Hawaii Volcanoes National Park on the island of Hawaii, and the Grand Canyon National Park, the Saguaro National Monument, and the Montezuma Castle National Monument, all in the state of Arizona.

Reader Comment

Dear Sir,
I should like to congratulate you on the continuing high standard of Parks and the interesting and informative articles it contains.

The innovative program on Wildlife Clubs of Kenya described in Vol. 3, No. 3 by Sandra Price was particularly interesting. However, I have some misgivings about the cover photograph in this issue. The excitement of the experience of close contact with a wild creature such as a rhino is reflected in the faces of the young members of the wildlife club. It is not possible to see if this is shared by the rhino. It is important for wildlife conservationists to ensure that the dignity of wild creatures is maintained and thus my reservation about the cover photograph in your magazine.

I trust that you will accept this view in the spirit in which it is made.

R. W. Boden, Assistant Director
Australian National Parks
and Wildlife Service

How to "Subscribe" to PARKS

The editors receive a great many letters from people who have seen or heard about PARKS Magazine and would like to have it sent to them on a regular basis.

The following information is published for the benefit of these people, and in the hope that regular readers will pass along the information when they are asked about the magazine.

At the present time PARKS Magazine is not available on a normal paid subscription basis. It is distributed without charge, by surface mail, to people who are actively and professionally involved in the planning, management or operation of national parks, nature parks, regional parks, nature or game reserves, cultural or historic reserves or monuments, museums, etc., or in related governmental activities and their ministries or departments. We interpret this to include natural and cultural conservation organizations (NGO, governmental or international), libraries, teachers, and university staffs, technical writers, researchers and others whose professional activity embraces the basic subject matter.

Request should be addressed to the Editor, PARKS Magazine, c/o National Park Service, U.S. Department of the Interior, Washington, D.C. 20240.

Update on the World Heritage Convention

List of States having deposited an instrument of ratification (R), acceptance (Ac), or accession (A) as of 20 March 1979

States	Date of deposit	
Afghanistan	20-03-79	R
Algeria	24-06-74	R
Argentina	23-08-78	Ac
Australia	22-08-74	R
Bolivia	04-10-76	R
Brazil	01-09-77	Ac
Bulgaria	07-03-74	Ac
Canada	23-07-76	Ac
Costa Rica	23-08-77	R
Cyprus	14-08-75	Ac
Ecuador	16-06-75	Ac
Egypt	07-02-74	R
Ethiopia	06-07-77	R
France	27-06-75	Ac
Germany (Federal Republic of)	23-08-76	R
Ghana	04-07-75	R
Guatemala	16-01-79	Ac
Guyana	20-06-77	Ac
India	14-11-77	R
Iran	26-02-75	Ac
Iraq	05-03-74	Ac
Italy	23-06-78	R
Jordan	05-05-75	R
Libyan Arab Jamahiriya	13-10-78	R
Mali	05-04-77	Ac
Malta	14-11-78	Ac
Monaco	07-11-78	R
Morocco	28-10-75	R
Nepal	20-06-78	Ac
Niger	23-12-74	Ac
Nigeria	23-10-74	R
Norway	12-05-77	R
Pakistan	23-07-76	R
Panama	03-03-78	R
Poland	29-06-76	R
Saudi Arabia	07-08-78	Ac
Senegal	13-02-76	R
Sudan	06-06-74	R
Switzerland	17-09-75	R
Syrian Arab Republic	13-08-75	Ac
Tunisia	10-03-75	Ac
United Republic of Tanzania	02-08-77	R
United States of America	07-12-73	R
Yugoslavia	26-05-75	R
Zaire	23-09-74	R

Many park areas throughout the world are visited during seasons when their waters are very cold. When water temperature gets down to 10°C (50°F) hypothermia may occur in a very few minutes. Anyone unlucky enough to fall into such cold water will require immediate and special care. Photo: Glacier Bay National Monument, Alaska –M. Woodbridge Williams.

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